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63. (Amended) A computer program product comprising a machine readable medium on which is provided program instructions for predicting properties of a chemical compound based on information about effects of at least one of a plurality of known compounds on one or more cell populations, the instructions comprising:

code for receiving one or more images of the at least one of a plurality of cells that have been exposed to the chemical compound;

code for determining, from the one or more images, multiple descriptors for multiple components of at least one of the plurality of cells, wherein said code for determining a multiple descriptors comprises code for performing principal component analysis on the said multiple descriptors;

code for determining a relationship between said descriptors of said chemical compound with other descriptors of said known compounds; and

code for making an inference about said chemical compound based upon said other descriptors,

wherein said descriptors and other descriptors comprise numeric or logical values.

REMARKS

Applicants respectfully request reconsideration of the rejections set forth in the Final Office Action mailed on October 2, 2001. Claims 49-61 and 63-65 have been rejected. Claim 62 has been objected to. Claim 62 has been cancelled herein. Accordingly, Claims 49-61 and 63-65 are now pending.

This amendment is to expedite prosecution and should not be construed as acquiescence in any ground of rejection. Applicants reserve the right to prosecute the originally filed claims in the future. A clean version of the amended claims with instructions for entry pursuant to 37 C.F.R. §1.121(c)(1)(i) is included above. A marked-up version of the amended claims pursuant to 37 C.F.R. §1.121(c)(1)(ii) is attached as Appendix I. The comments in the Office action are now addressed in turn.

Drawings Notice

Applicant have submitted concurrently herewith the formal drawings for the above-identified patent application. Copies of the formal drawings and the Letter to the Official Draftsman are enclosed.

Information Disclosure Statement

Contrary to the Examiner's assertion, Applicants maintain that reference C1 of the information disclosure statement filed March 26, 2001 did indeed include a publication date. The reference is a printout from the Q3DM website. The PTO 1449 form specifically indicated that the reference was printed (i.e., published) on March 1, 2001. Applicants respectfully maintain that the citation of the reference thus complies with the provisions of 37 C.F.R. §§1.97 and 1.98 and MPEP §609. A copy of reference O of the information disclosure statement filed January 19, 2001 is also provided herein. Both references are cited on the accompanying PTO 1449. The Examiner is requested to make these citations of official record in the application.

Rejections under 35 U.S.C. § 103

Claims 49, 50, 56, 57, 59-61, and 63-65 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Biodx in view of Weaver *et al.* U.S. Patent No. 4,959,301 ("Weaver"). In addition, Claims 49, 50, 56, 57, 59-61, and 63-65 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Biodx in view of Singhvi *et al.* U.S. Patent No. 5,776,748 ("Singhvi"). Claims 49-61 and 63-65 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Biodx in view of Weaver or Biodx and Singhvi and further in view of Pauwels. This rejection is respectfully traversed as applied to the amended claims.

The teachings of Biodx, Weaver, Singhvi, and Pauwels have been discussed previously.

As discussed above, the claims have been amended herein to focus on a particularly preferred embodiment of the invention, namely, the creation of cellular fingerprints reflecting the effects of manipulations on two or more components of cells and the analysis of such fingerprints whereby the effects of manipulations can be clustered or otherwise statistically analyzed. Principal component analysis is used for analyzing the descriptors.

Claim 62 was drawn to this embodiment. Applicants acknowledge with the appreciation the Examiner's indication that Claim 62 would be allowable if rewritten in independent form. Applicants have done so herein by incorporating the limitations of Claim 62 into original independent Claim 56. Similar limitations have been included in independent Claims 49 and 63.

None of the cited references teach or suggest this limitation, and so they cannot be combined to render the pending claims obvious. None of the secondary references cure the lack of suggestion of the primary reference to perform multivariate analysis on the effects of cellular manipulations on two or more cellular components.

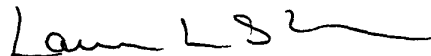
For these reasons, withdrawal of the rejections is respectfully requested.

Conclusion

The Applicant respectfully maintains that all pending claims are in condition for allowance. Therefore, the Applicant respectfully requests a Notice of Allowance for this Application from the Examiner. Should any unresolved issues remain, the Examiner is encouraged to contact the undersigned at the telephone number provided below.

Respectfully submitted,

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MARKED UP VERSION OF AMENDED CLAIMS

49. (Twice Amended) A computer program product for determining a property of a manipulation based upon determination of effects of said manipulation on at least two of a plurality of components of at least one of a plurality of cells, said computer program product comprising:

code for receiving one or more images of at least two of a plurality of components of at least one of a plurality of cells that have been exposed to the manipulation, wherein said manipulation is selected from the group consisting of applying a hormone, applying a growth factor, applying an extracellular matrix component, applying a virus, applying an electroporation, applying an antisense polynucleotide, applying a gene knock-out, applying a gene overexpression, applying a gene mutation, applying a cell fusion, and combinations thereof;

code for determining at least one of a plurality of features of a first component of said at least two of a plurality of components and at least one of a plurality of features of a second component of said at least two of a plurality of components;

code for determining a plurality of descriptors, wherein said code for determining a plurality of descriptors comprises code for performing principal component analysis on said plurality of descriptors, wherein said descriptors comprise at least one said plurality of features of said first component or at least one of a plurality of features of said second component and wherein at least one of said plurality of descriptors is formed by combining features of said first component and said second component;

code for searching a plurality of descriptors obtained from a database to locate descriptors based upon one of said descriptors of said manipulation, said searching forming a plurality of located descriptors;

code for determining, based upon said located descriptors, properties of said manipulation based upon said located descriptors; and

a computer readable storage medium for holding the codes.

56. (Amended) A computer program product comprising a machine readable medium on which is provided program instructions for determining an effect of a manipulation on a plurality of cells, the instructions comprising:

code for receiving one or more images of at least one of the plurality of cells that have been exposed to the manipulation;

code for determining, from the one or more images, a first descriptor for a first component of at least one of the plurality of cells and a second descriptor for a second component of at least one of the plurality of cells; and

code for analyzing the first and second descriptors to determine the effect of the manipulation on the plurality of cells, said code for analyzing the first and second descriptors comprising code for performing principal component analysis on the first and second descriptors.

63. (Amended) A computer program product comprising a machine readable medium on which is provided program instructions for predicting properties of a chemical compound based on information about effects of at least one of a plurality of known compounds on one or more cell populations, the instructions comprising:

code for receiving one or more images of the at least one of a plurality of cells that have been exposed to the chemical compound;

code for determining, from the one or more images, multiple descriptors for multiple components of at least one of the plurality of cells, wherein said code for determining a multiple descriptors comprises code for performing principal component analysis on the said multiple descriptors;

code for determining a relationship between said descriptors of said chemical compound with other descriptors of said known compounds; and

code for making an inference about said chemical compound based upon said other descriptors,

wherein said descriptors and other descriptors comprise numeric or logical values.